



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,010	12/07/2000	Akira Miyazaki	017498/0149	5826

22428 7590 05/05/2003

FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 05/05/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,010

Applicant(s)

MIYAZAKI ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 9-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1763

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 25, 2003 has been entered.

Claim Objections

2. Claim 4 is objected to because of the following informalities: In the amendment mailed August 16, 2002, page 2, line 3, the term "electrostatic" is misspelled. The correct spelling is "electrostatic". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

Art Unit: 1763

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Koshiishi et al. (U.S. 5,919,332).

Referring to Drawing 1, abstract, and paragraphs [0010], [0012] – [0016], Imafuku discloses a plasma treatment device using a polycrystalline alumina sintered product which has high plasma resistance. This plasma treatment device comprises a processing container 4 (reaction chamber), a showerhead 36 (upper electrode), an installation base 6 (lower electrode), and a clamp ring 24, which is used to hold the wafer W and used as a focal function (focus ring) to direct ions to the wafer W [0013]. The clamp ring 24 and shield ring 46 are made of the polycrystalline alumina sintered product. The polycrystalline alumina sintered product is made of alumina and magnesia (MgO) and has a purity of 99.9%, a bulk density of 3.98 g/cm³, and an average grain size of 10-100 micrometers.

Referring to Drawing 6, and paragraphs [0023]-[0024], Imafuku discloses that an electrostatic chuck 70 can be used to hold the wafer instead of a clamp ring. In addition, the focal ring 78 is used to direct ions to the wafer W [0024].

Imafuku fails to teach the surface roughness, electrode insulating member, and a covering member.

Art Unit: 1763

Referring to Figure 20 and column 27, lines 9-12, lines 46-60, Koshiishi teaches a plasma processing apparatus comprising a seal ring 125 (electrode insulating member) for electric insulation between the upper electrode 102 and the chamber 10, and a focus ring 119. Both the seal ring 125 and the focus ring 119 are made of quartz and have alumina-based ceramic layers 120 and 126 over them. The alumina has a surface roughness of $2\mu\text{m}$, to prevent secondary reaction products from sticking thereto, and to facilitate removal of any products. In addition, an alumina-based ceramic layer 131 (covering member) is provided along the chamber walls. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the alumina sintered product of Imafuku with surface roughness as taught by Koshiishi, and to provide the apparatus of Imafuku with the electrode insulating member and covering as taught by Koshiishi. This would protect the apparatus and parts from plasma damage, therefore extending the life of the parts, and prevent sticking to the parts.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Koshiishi et al. (U.S. 5,919,332) as applied to claims 1, 3, and 4 above, and further in view of Matsubara et al. (U.S. 6,149,730).

The teachings of Imafuku in view of Koshiishi have been discussed above.

Imafuku in view of Koshiishi disclose the apparatus substantially as claimed, however fails to show a cover body.

Referring to Figure 2 and column 8, lines 1-35, Matsubara shows a chemical vapor deposition apparatus which uses a ring-shaped member 111 (cover body) to cover a peripheral portion of the wafer 106 (body). This ring-shaped member 111 prevents plasma processing on

Art Unit: 1763

the peripheral portion of the wafer. It would have been obvious to one of ordinary skill in the art to provide the apparatus of Imafuku in view of Koshiishi with the cover body as shown by Matusbara. This would prevent plasma processing on the peripheral portion of the wafer.

7. Claim 2, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Koshiishi et al. (U.S. 5,919,332) as applied to claims 1, 3, and 4 above, and further in view of Ando (Japanese Patent Publication 01-213910).

The teachings Imafuku in view of Koshiishi have been discussed above.

Imafuku in view of Koshiishi disclose the apparatus substantially as claimed, however fails to teach the Si content and the alkali content.

Referring to constitution, Ando teaches an alumina composition to have a Si content of less 80 ppm, Mg content of less than 60 ppm, and alkali components less than 60 ppm. This alumina composition has excellent machinability qualities, good mechanical strength and high resistance to plasma. It would have been obvious to one of ordinary skill in the art at the time of the invention for the alumina sintered product of Imafuku to have a composition as taught by Ando. This would provide the alumina sintered product with excellent machinability, good mechanical strength and high resistance to plasma.

8. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Koshiishi et al. (U.S. 5,919,332) and Ando

Art Unit: 1763

(Japanese Patent Publication 01-213910) as applied to claims 2, 6, and 7 above, and further in view of Matsubara et al. (U.S. 6,149,730).

The teachings of Imafuku in view of Koshiishi and Ando have been discussed above.

Imafuku in view of Koshiishi and Ando disclose the apparatus substantially as claimed, however fails to show a cover body.

Referring to Figure 2 and column 8, lines 1-35, Matsubara shows a chemical vapor deposition apparatus which uses a ring-shaped member 111 (cover body) to cover a peripheral portion of the wafer 106 (body). This ring-shaped member 111 prevents plasma processing on the peripheral portion of the wafer. It would have been obvious to one of ordinary skill in the art to provide the apparatus of Imafuku in view of Koshiishi and Ando with the cover body as shown by Matsubara. This would prevent plasma processing on the peripheral portion of the wafer.

Response to Arguments

9. Applicant's arguments filed August 16, 2002 have been fully considered but they are not persuasive.

Applicant has argued that the claimed invention provides unexpected results in comparison with the closest prior art. However, the unexpected results are not commensurate with the claimed range. The results in Tables 1 and 2 only show data for a specific average grains size, corresponding with a specific surface roughness and with a specific bulk density. Therefore, the showing of unexpected results over the entire claimed range has not been demonstrated.. Additionally, the applicant has particularly pointed out one average grain size to compare with the prior art; however, the prior art shows other average grain sizes in the claimed

Art Unit: 1763

range. Therefore, the claimed invention is obvious over the combination of references as stated above, and consequently the rejection is respectfully maintained..

Allowable Subject Matter

10. Claims 9-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to disclose a dense alumina sintered product having a combination of a specific average grain size, a specific surface roughness, and a specific bulk density. Therefore, the claims 9-14 would be allowable if rewritten in independent form, since unexpected results have been successfully demonstrated.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *ame*
May 2, 2003

Alejandro
Luz L. Alejandro
Primary Examiner
Art Unit 1763